W02737-42

Quanterra
Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

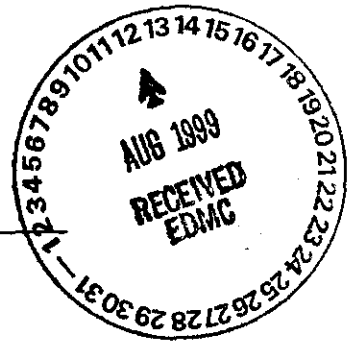
CASE NARRATIVE

0051527

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

April 28, 1999

Attention: Joan Kessner



Project Number	:	550.186
SDG	:	W02737
Number of Samples	:	One (1)
Sample Matrix	:	Soil
Data Deliverable	:	Priority/Summary (IV/EA)
Date SDG Closed	:	April 8, 1999

II. Introduction

On April 8, 1999, one (1) "soil" sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. The samples were received at Quanterra, St. Louis on April 12, 1999 at a temperature of 17°C. The client was informed as to the temperature variance on April 15, 1999 when the condition upon receipt form and chain of custody was transmitted by facsimile. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

St. Louis ID	BHI ID	SAF ID	Matrix	Date of Receipt
21098-001	B0V1X1	B99-002	SOIL	08-APR-99

III. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Analyses requested: ICP Metals (Chromium & Lead) by EPA method 6010A
Mercury by EPA method 7471

Deviation from Request: No Deviation from requested methods.

000002

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:
QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike
MS- Matrix Spike.
MSD- Matrix Spike Duplicate.

V. Comments

General: Priority results were transmitted via facsimile on April 26, 1999.

Condition Upon Receipt (CUR) number 018492 included in the package incorrectly states that COC number B99-002-76 was not relinquished. This occurred because of an internal misunderstanding. This comment will not be on future CURs when this situation occurs. When both radiochemical and chemical samples are received at Quanterra-Richland the chemical containers are forwarded on to Quanterra-St. Louis with a copy of the Bechtel COC for information and a Quanterra-Richland COC to document that only the chemical portion was shipped. Therefore, only the Quanterra-Richland COC is relinquished because to relinquish the Bechtel COC would imply that all samples on the Bechtel COC were relinquished to Quanterra-St. Louis.

Metals: A Laboratory Control Sample, Method Blank, Matrix Spike and Matrix Spike Duplicate were analyzed with each preparation batch per the protocol for this analysis.

"No comments" were noted for this analysis.

I certify that this Summary is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Shiela M. Louvier
St. Louis Project Manager

Did You Know?

Quanterra provides technical presentations on a number of topics that should be of interest.

An example is "Chemical Measurements of Environmental Samples: Key Concepts for Effective Data Generation". This presentation focuses on fundamental measurement concepts that will improve the quality of the laboratory effort and the effectiveness of the interaction with the laboratory. Major components of the presentation include planning laboratory analyses, selecting laboratory methods and QC samples, and evaluating laboratory data. Planning the laboratory analyses addresses analyte and parameter selection to meet various EPA regulations, selecting the right type of QC samples for analysis, and establishing measurement quality objectives.

Selecting the right method is perhaps the most critical part of a data generation method. The selection should address both the measurement quality objectives and the service needs of the project, balancing a multitude of factors. After the laboratory report is received, much remains to be done. EPA has published guidance on the expected level of quality needed for decision making (QA3). Data of this quality should be evaluated relative to the reliability of the analyte identification and quantitation and to determine the analytical error.

If you are interested in this presentation or a list of other presentation topics, please call Marty Cahill.

Quanterra Environmental Services
13715 Rider Trail North
Earth City, Missouri 63045

Telephone: 314-298-8566
FAX: 314-298-8757

DATE: 4.15.99

TO: Joan Kessner

COMPANY: BHF

FAX NUMBER: 509-372-9487

FROM: Jennifer Smith

NUMBER OF PAGES: (INCLUDING COVER) 4

☐ Urgent ☐ Please Reply
☐ For review ☐ Please Comment

MESSAGE:

Condition Upon Receipt

550.186 SDG: W02737

Login 21098

FAXED

FAX TRANSMISSION

Quanterra April 14, 1999 02:06 pm
Account: 10722 Project: 550.186 Quanterra-Richland QAS No. 550.186 Rev. 2
Master Sample Login: 21098

Project Manager: S. Louvier

Reviewed by and Date: JSmith 4-14-99

Sample Header Template: 3*

Sample No.	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
Comments								
# Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)	
Data:								
21098-001	B0V1X1	Soil	06-APR-99 10:10	08-APR-99 13:50	22-APR-99	AIRBORNE	3*	R8452-001
SAF B99-002/ICAP = CR,PB.								
1 GN - Glass Jar-250ML	HG/7471/Q4	S	COLD	20-APR-99	04-MAY-99	R21E	(438037:99)	
1	ICAP/6010/Q4	S	COLD	20-APR-99	03-OCT-99	R21E	(438037:99)	
1	PM/IT/Q4	S	COLD	20-APR-99	03-OCT-99	R21E	(438037:99)	
1	RAD/CSCREEN/Q4	S	COLD	20-APR-99	05-OCT-99	R21E	(438037:99)	
21098-001MS	B0V1X1	Soil	06-APR-99 10:10	08-APR-99 13:50	22-APR-99	AIRBORNE	3*	R8452-001
SAF B99-002/ICAP = CR,PB.								
1 GN - Glass Jar-250ML	HG/7471/Q4	S	COLD	20-APR-99	04-MAY-99	R21E	(438037:99)	
1	ICAP/6010/Q4	S	COLD	20-APR-99	03-OCT-99	R21E	(438037:99)	
21098-001MSD	B0V1X1	Soil	06-APR-99 10:10	08-APR-99 13:50	22-APR-99	AIRBORNE	3*	R8452-001
SAF B99-002/ICAP = CR,PB.								
1 GN - Glass Jar-250ML	HG/7471/Q4	S	COLD	20-APR-99	04-MAY-99	R21E	(438037:99)	
1	ICAP/6010/Q4	S	COLD	20-APR-99	03-OCT-99	R21E	(438037:99)	

3*=Sample has not been rad screened.

Chain of Custody Record

STL0110 CUR018492

Quanterra

QUA-4124 0797

Client: BHI	Project Manager: Doug Swenson	Date: 4-9-99	Chain of Custody Number: 10318
Address:	Telephone Number (Area Code)/Fax Number:	Lab Number:	Page 1 of 1
City:	State:	Zip Code:	Site Contact:	Lab Contact:
Project Name: SAF B99-002	Carrier/Waybill Number:	Analysis (Attach list if more space is needed): SEE COC
Contract/Purchase Order/Quote No.	Special Instructions/ Conditions of Receipt

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH
BOVIX1	Chem Anal.					Bottles					

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal

☒ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 3 months)

Turn Around Time Required

☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other 15day

QC Requirements (Specify): SDG W02737

	Relinquished By	Date	Time	Received By	Date	Time
1.	Heidelberg QES	4-9-99	1600		4-12-99	0800
2.						
3.						

Comments

$1000

DISTRIBUTION: WHITE - Stays with the Sample; CANARY - Returned to Client with Report; PINK - Field Copy

W02737

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-002-76

Page 1 of 1

Collector: Fahlberg/Coffman	Company Contact: R Coffman	Telephone No.: 373-6425	Project Coordinator: TRENT, SJ
Project Designation: 100 BC Areas - Full Protocol	Sampling Location: 100 B/C 116-B-12 shallow zone		SAF No.: B99-002
Ice Chest No.: ERC99-004	Field Logbook No.: EL 1327-2		Method of Shipment: Gov vehicle
Shipped To: Quanterra Incorporated	Offsite Property No.		Bill of Lading/Air Bill No.
			COA

Price Code

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS: DW H-23

Special Handling and/or Storage

SDG W02737

SAMPLE ANALYSIS: J9D080212

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s) / Volume	Activity Scan	See item (1) in Special Instructions	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions
				None	aG	1 / 60mL				
				None	aG	1 / 60mL				
				None	aG	1 / 250mL				
				None	Marinelli	1 / 500mL				
B0V1X1 CTERK	Soil	4-6-99	1010				X	X	X recvd	X 100% full

B0V1R

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By	R Fahlberg / R Fahlberg	4/6/99 1625
Received By	Ref 1-C	4.6.99 1625
Relinquished By	Ref 1-C	4/8/99 1330
Received By	Renee Nelson / R. Nelson	4-8-99 1330
Relinquished By	R. Nelson	4-8-99 1350
Received By	R Fahlberg	4-8-99 1350
Relinquished By		
Received By	Federal Express	4-12-99 0800

SPECIAL INSTRUCTIONS

(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63

(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

R. Fahlberg unavailable to relinquish samples

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

9900096

018492

Quanterra
Environmental Services

Login No.: 21098
WO2737
8 SW

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: Richland / BHI
Date: 4-12-99 Time: 0800
Project No: 530.186
Initiated by: Sue Olson
Shipper/No: Airborne 5157788473
RFA/COC Numbers: B99-002-76 / 10318
JRS 4/14/99

Condition/Variance (Check all that apply):

1. ☐ Sample received broken/leaking.
2. ☐ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4-C ± 2-C
     Record temperature: _____
   - ☐ pH _____
   - ☐ other: _____
3. ☐ Sample received in improper container.
4. ☐ Sample received without proper paperwork. Explain: _____
5. ☐ Paperwork received without sample.
6. ☐ No sample ID on sample container.
7. ☐ Custody tape disturbed/broken/missing/not tamper evident (circle all that apply).
8. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
9. ☐ All coolers on airbill not received with shipment.
10. ☐ Other (explain below): _____

☑ No variances were noted during sample receipt. Cooler Temperature Upon Receipt: 17° melted blue ice

Temperature Variance Does Not Affect the Following Analyses: metals

Notes: COC # B99-002-76 was not relinquished. JRS 4-14-99

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☐ Client's Name: _____ Informed in writing on: _____ By: _____

☐ Sample(s) processed "as is".

☐ Sample(s) on hold until: _____ If released, notify: _____

Comments:

Sample Control Supervisor Review: (or designate) Sue Olson Date: 4-12-99

Project Management Review: J Smith Date: 4-14-99

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

SL-ADMIN-0004, Revised 3/17/99

000007

METALS

Quanterra

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, WA 99352

Project: 550.186

Category: ICAP Metals TAL + Lead
Method: EPA 6010
Matrix: SOLID

Sample Date : 04/06/99
Receipt Date : 04/08/99
Report Date : 04/22/99

Client ID: B0V1X1

Quanterra ID : 21098-001

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Chromium	7440-47-3	QCBLK197773-1	04/19/99	04/20/99	10.5	MG/KG		1.0	1
Lead	7439-92-1	QCBLK197773-1	04/19/99	04/20/99	5.3	MG/KG	B	10.5	1

Quanterra

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, WA 99352

Project: 550.186

Category: ICAP Metals TAL + Lead
Method: EPA 6010
Matrix: SOLID

Sample Date : 04/06/99
Receipt Date : 04/08/99
Report Date : 04/22/99

Client ID: B0V1X1

Quanterra ID : 21098-001MS

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Chromium	7440-47-3	QCBLK197773-1	04/19/99	04/20/99	90	%REC			1
Lead	7439-92-1	QCBLK197773-1	04/19/99	04/20/99	92	%REC			1

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, WA 99352

Project: 550.186

Category: ICAP Metals TAL + Lead
Method: EPA 6010
Matrix: SOLID

Sample Date : 04/06/99
Receipt Date : 04/08/99
Report Date : 04/22/99

Client ID: B0V1X1

Quanterra ID : 21098-001MSD

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Chromium	7440-47-3	QCBLK197773-1	04/19/99	04/20/99	89	%REC			1
Lead	7439-92-1	QCBLK197773-1	04/19/99	04/20/99	89	%REC			1

Quanterra

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, WA 99352

Project: 550.186

Category: Mercury
Method: SW846 7471
Matrix: SOLID

Sample Date : 04/06/99
Receipt Date : 04/08/99
Report Date : 04/22/99

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0V1X1	21098-001	Mercury	7439-97-6	QCBLK197934-1	04/21/99	04/21/99	0.017	MG/KG	U	0.035	1
B0V1X1	21098-001MS	Mercury	7439-97-6	QCBLK197934-1	04/21/99	04/21/99	112	%REC			1
B0V1X1	21098-001MSD	Mercury	7439-97-6	QCBLK197934-1	04/21/99	04/21/99	109	%REC			1
NA	QCLCS197934-1	Mercury	7439-97-6	QCBLK197934-1	04/21/99	04/21/99	86	%REC			2
NA	QCBLK197934-1	Mercury	7439-97-6	QCBLK197934-1	04/21/99	04/21/99	0.017	MG/KG	U	0.033	1

U.S. EPA - CLP

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Lab Name: QUANTERRA_MO_____ Contract: 550.186___

Lab Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: W02737_____

SOW No.: SW846

EPA Sample No.	Lab Sample ID
_B0V1X1_____	_21098-001____
_B0V1X1SD____	_21098-001SD__
_B0V1X1S_____	_21098-001S___
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Were ICP interelement corrections applied ? Yes/No YES

Were ICP background corrections applied ? Yes/No YES
If yes - were raw data generated before application of background corrections ? Yes/No NO_

Comments:

_____

_____

_____

_____

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: _____ Name: _____

Date: _____ Title: _____

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0V1X1

Lab Name: QUANTERRA_MO_____ Contract: 550.186___
Lab Code: ITMO__ Case No.:_____ SAS No.:_____ SDG No.: W02737_____
Matrix (soil/water): SOIL_ Lab Sample ID: 21098-001
Level (low/med): LOW__ Date Received: 04/08/99
% Solids: _95.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7440-47-3	Chromium	10.5			P
7439-92-1	Lead	5.3	B		P
7439-97-6	Mercury	0.02	U		CV

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

FORM I - IN

SW-846

Quanterra

Analytical Data Package Prepared For

Bechtel Hanford

Analysis By

Quanterra Analytical Services

Richland Laboratory

Report Nbr: 7870

SDG No.	SAF No.	CLIENT ID No.	QUANTERRA ID No.
W02737	B99-002	B0V1X1	9CTERK10

0001

Comments:

Quanterra

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

June 1 1999

Data Log In

Attention: Joan Kessner

SAF Number	:	B99-002
Date First Sample Received	:	April 8, 1999
Number of Samples	:	One
Sample Type	:	Soil
SDG Number	:	W02737
Data Deliverable	:	15 Day priority/45 Day Summery

I. Introduction

On April 8 16, 1999 the Quanterra Environmental Services Richland Laboratory (QESRL) received ~~three~~ one soil samples for a 45-day radiochemical analysis. Upon receipt, the samples were assigned ~~the~~ following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QESRL ID#	BHI ID#	MATRIX	DATE OF RECEIPT
9CTERK10	B0V1X1	~~OTHER~~ SOIL DSA 6/8/99	4/8/99

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information; analytical results and the appropriate associated statistical errors.

The requested analyses were:

Alpha Spectroscopy
Plutonium-238, -239/40 by method RICH-RC-5010
Americium-241 by method RICH-RC-5080
Uranium isotopic by method RICH-RC-5079
Gamma Spectroscopy

Gamma Scan by method RICH-RC-5017
Gas Proportional Counting
Total Strontium by method RICH-RC-5006
Liquid Scintillation Counting
Nickel-63 by method RICH-RC-5069

III. Quality Control

The analytical results for each analysis performed under SDG W02737 includes a minimum of two Laboratory Control Samples (LCS) and one method (reagent) blank. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results.

IV. Comments

Alpha Spectroscopy
Plutonium-238, -239/40 by method RICH-RC-5062
The LCS, batch blank, sample duplicate (B0V1X1) and sample results are within contractual requirements.

Americium-241 by method RICH-RC-5080
The LCS, batch blank, sample duplicate (B0V1X1) and sample results are within contractual requirements.

Uranium isotopic by method RICH-RC-5079
The LCS, batch blank, sample duplicate (B0V1X1) and sample results are within contractual requirements

Gamma Spectroscopy
Gamma Scan by method RICH-RC-5017
The sample was recounted due to switch between the blank and the LCS the MDA for Ra-226 was not met. Recount all data within specifications, recount reported. Except as noted, the LCS, batch blank, sample duplicate (B0V1X1) and sample results are within contractual requirements.

Gas Proportional Counting
Total Strontium by method RICH-RC-5006
The LCS, batch blank, sample duplicate (B0V1X1) and sample results are within contractual requirements

Liquid Scintillation Counting
Nickel-63 by method RICH-RC-5069
The LCS, batch blank, sample duplicate (B0V1X1) and sample results are within contractual requirements
I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Doug Swenson
Project Manager

Quanterra

SAMPLE RESULTS

LAB NAME:	**QUANTERRA, Richland**	**SDG: /RPT GRP:**	W02737 / 7870
LAB SAMPLE ID:	9CTERK10	**MATRIX:**	SOIL
CLIENT ID:	B0V1X1	**DATE RECEIVED:**	4/8/99 1:50:00 PM

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	2.18E-01	J	6.7E-02	7.3E-02	1.40E-02	pCi/g	99.50%	RICHRC5080
U-234	5.37E-01	J	1.2E-01	1.4E-01	2.86E-02	pCi/g	67.20%	RICHRC5030
U-235	4.80E-02	J	3.5E-02	3.6E-02	3.34E-02	pCi/g	67.20%	RICHRC5030
U-238	7.23E-01	J	1.3E-01	1.7E-01	3.34E-02	pCi/g	67.20%	RICHRC5030
PU-238	-1.68E-03	U	1.9E-03	2.0E-03	3.50E-02	pCi/g	58.80%	RICHRC5010
PU239/40	1.35E-02	U	2.0E-02	2.0E-02	2.82E-02	pCi/g	58.80%	RICHRC5010
AM-241	-1.77E-02	U	8.1E-02	8.1E-02	1.34E-01	pCi/g		RICHRC5017
CO-60	3.99E-02	U	3.1E-02	3.1E-02	5.59E-02	pCi/g		RICHRC5017
CS-137	1.19E-02	U	2.9E-02	2.9E-02	4.85E-02	pCi/g		RICHRC5017
EU-152	8.18E-04	U	7.9E-02	7.9E-02	1.10E-01	pCi/g		RICHRC5017
EU-154	1.68E-02	U	9.4E-02	9.4E-02	1.60E-01	pCi/g		RICHRC5017
EU-155	2.10E-02	U	5.6E-02	5.6E-02	9.38E-02	pCi/g		RICHRC5017
RA-226	4.05E-01		1.2E-01	1.2E-01	8.34E-02	pCi/g		RICHRC5017
RA-228	4.64E-01		2.0E-01	2.0E-01	1.85E-01	pCi/g		RICHRC5017
U-238DHP	1.06E+00	U	7.2E-01	7.2E-01	1.21E+00	pCi/g		RICHRC5017
STRONTIUM	-3.73E-02	U	4.9E-02	5.1E-02	1.45E-01	pCi/g	74.40%	RICHRC5006
NI-63	4.73E+00	U	2.7E-01	4.6E+00	7.07E+00	pCi/g	66.62%	RICHRC5069

Number of Results: 17

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result <

Quanterra

DUPLICATE RESULTS

LAB NAME:	**QUANTERRA, Richland**	**SDG: /RPT GRP:**	W02737 / 7870
LAB SAMPLE ID:	CTERK1ER	**MATRIX:**	SOIL
CLIENT ID:	B0V1X1 DUP	**DATE RECEIVED:**	4/8/99 1:50:00 PM
ORIG LAB SAMPLE ID:	9CTERK10		

ANALYTE	DUP RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
AM-241	2.25E-02	U	8.0E-02	8.0E-02	1.37E-01	pCi/g		RICHRC5017	-1.77E-02	1687.62%
CO-60	1.75E-02	U	2.5E-02	2.5E-02	4.54E-02	pCi/g		RICHRC5017	3.99E-02	77.89%
CS-137	-4.64E-03	U	2.4E-02	2.4E-02	3.97E-02	pCi/g		RICHRC5017	1.19E-02	457.07%
EU-152	-1.07E-02	U	5.0E-02	5.0E-02	8.46E-02	pCi/g		RICHRC5017	8.18E-04	233.26%
EU-154	-8.98E-02	U	7.8E-02	7.8E-02	1.24E-01	pCi/g		RICHRC5017	1.68E-02	291.92%
EU-155	6.16E-02	U	4.2E-02	4.2E-02	7.43E-02	pCi/g		RICHRC5017	2.10E-02	98.32%
RA-226	4.50E-01		1.3E-01	1.3E-01	7.05E-02	pCi/g		RICHRC5017	4.05E-01	10.50%
RA-228	1.06E+00		2.0E-01	2.0E-01	1.44E-01	pCi/g		RICHRC5017	4.64E-01	77.89%
U-238DHP	5.11E-01	U	1.1E+00	1.1E+00	1.10E+00	pCi/g		RICHRC5017	1.06E+00	69.52%

Number of Results: 9

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra

DUPLICATE RESULTS

LAB NAME:	**QUANTERRA, Richland**	**SDG: /RPT GRP:**	W02737 / 7870
LAB SAMPLE ID:	CTERK1GR	**MATRIX:**	SOIL
CLIENT ID:	B0V1X1 DUP	**DATE RECEIVED:**	4/8/99 1:50:00 PM
ORIG LAB SAMPLE ID:	9CTERK10		

ANALYTE	DUP RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
NI-63	4.16E+00	U	2.4E-01	4.3E+00	6.60E+00	pCi/g	73.92%	RICHRC5069	4.73E+00	12.78%

Number of Results: 1

0007

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra Analyticall Services, Inc

rptChemRadDup; v3.41

Quanterra

DUPLICATE RESULTS

LAB NAME:	**QUANTERRA, Richland**	**SDG: /RPT GRP:**	W02737 / 7870
LAB SAMPLE ID:	JCTERK1R	**MATRIX:**	SOIL
CLIENT ID:	B0V1X1	**DATE RECEIVED:**	4/8/99 1:50:00 PM
ORIG LAB SAMPLE ID:	9CTERK10		

ANALYTE	DUP RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
AM-241	1.89E-01	J	6.6E-02	7.1E-02	2.63E-02	pCi/g	97.80%	RICHRC5080	2.18E-01	14.08%
U-234	5.38E-01	J	1.1E-01	1.3E-01	2.74E-02	pCi/g	69.70%	RICHRC5030	5.37E-01	0.26%
U-235	1.75E-02	U	2.1E-02	2.1E-02	2.41E-02	pCi/g	69.70%	RICHRC5030	4.80E-02	93.21%
U-238	6.77E-01	J	1.3E-01	1.6E-01	4.35E-02	pCi/g	69.70%	RICHRC5030	7.23E-01	6.60%
PU-238	-6.91E-03	U	4.6E-03	4.7E-03	6.39E-02	pCi/g	42.50%	RICHRC5010	-1.68E-03	121.61%
PU239/40	8.06E-03	U	1.9E-02	1.9E-02	4.38E-02	pCi/g	42.50%	RICHRC5010	1.35E-02	50.26%
STRONTIUM	1.26E-02	U	5.8E-02	5.8E-02	1.46E-01	pCi/g	78.00%	RICHRC5006	-3.73E-02	404.65%

Number of Results: 7

0008

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra

BLANK RESULTS

LAB NAME: QUANTERRA, Richland **SDG /RPT GRP:** W02737 / 7870

LAB SAMPLE ID: CTPL611B **MATRIX:** URINE

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	0.00E+00	U	0.0E+00	4.1E-03	4.52E-03	dpm/s	68.09%	RICHRC5010
PU239/40	5.00E-03		5.8E-03	5.9E-03	4.52E-03	dpm/s	68.09%	RICHRC5010

Number of Results: 2

0009

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL

Quanterra Analytical Services, Inc

rptChemRadBlank; v3.41

Quanterra

BLANK RESULTS

LAB NAME: QUANTERRA, Richland **SDG /RPT GRP:** W02737 / 7870

LAB SAMPLE ID: CV63J11X **MATRIX:** SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	-2.93E-03	U	3.7E-02	3.7E-02	6.14E-02	pCi/g		RICHRC5017
CO-60	-5.25E-03	U	1.7E-02	1.7E-02	3.00E-02	pCi/g		RICHRC5017
CS-137	-3.20E-03	U	1.6E-02	1.6E-02	2.78E-02	pCi/g		RICHRC5017
EU-152	-4.73E-03	U	3.8E-02	3.8E-02	6.26E-02	pCi/g		RICHRC5017
EU-154	-7.65E-03	U	4.4E-02	4.4E-02	7.73E-02	pCi/g		RICHRC5017
EU-155	9.38E-03	U	2.6E-02	2.6E-02	4.54E-02	pCi/g		RICHRC5017
RA-226	1.28E-01	U	4.6E-02	4.6E-02	6.82E-02	pCi/g		RICHRC5017
RA-228	-6.57E-02	U	1.1E-01	1.1E-01	1.22E-01	pCi/g		RICHRC5017
U-238DHP	-2.52E-01	U	5.3E-01	5.3E-01	5.75E-01	pCi/g		RICHRC5017

Number of Results: 9

0010

Quanterra

BLANK RESULTS

LAB NAME: QUANTERRA, Richland **SDG /RPT GRP:** W02737 / 7870

LAB SAMPLE ID: CW0NA11B **MATRIX:** SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
NI-63	2.30E+00	U	1.3E-01	3.3E+00	5.16E+00	pCi/g	97.46%	RICHRC5069

Number of Results: 1

0011

Result = IDL When Not Detected

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL

Quanterra

BLANK RESULTS

LAB NAME: QUANTERRA, Richland **SDG /RPT GRP:** W02737 / 7870

LAB SAMPLE ID: JCTHCT1B **MATRIX:** SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
PU-238	-2.87E-03	U	4.1E-03	4.1E-03	8.20E-02	pCi/g	23.40%	RICHRC5010
PU239/40	0.00E+00	U	0.0E+00	5.4E-02	4.86E-02	pCi/g	23.40%	RICHRC5010

Number of Results: 2

0012

Quanterra

BLANK RESULTS

LAB NAME: QUANTERRA, Richland **SDG /RPT GRP:** W02737 / 7870

LAB SAMPLE ID: JCTHCV1B **MATRIX:** SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	-1.21E-03	U	1.4E-03	1.4E-03	2.52E-02	pCi/g	75.20%	RICHRC5080

Number of Results: 1

0013

Quanterra

BLANK RESULTS

LAB NAME: QUANTERRA, Richland **SDG /RPT GRP:** W02737 / 7870

LAB SAMPLE ID: JCTHCV1B **MATRIX:** SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
AM-241	-1.21E-03	U	1.4E-03	1.4E-03	2.52E-02	pCi/g	75.20%	RICHRC5080

Number of Results: 1

0014

Quanterra

BLANK RESULTS

LAB NAME: QUANTERRA, Richland **SDG /RPT GRP:** W02737 / 7870

LAB SAMPLE ID: JCTHCW1B **MATRIX:** SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
U-234	9.57E-03	U	1.6E-02	1.6E-02	3.04E-02	pCi/g	81.00%	RICHRC5030
U-235	-2.28E-03	U	2.0E-03	2.1E-03	3.22E-02	pCi/g	81.00%	RICHRC5030
U-238	3.42E-03	U	1.2E-02	1.2E-02	3.22E-02	pCi/g	81.00%	RICHRC5030

Number of Results: 3

0015

Quanterra

BLANK RESULTS

LAB NAME: QUANTERRA, Richland **SDG /RPT GRP:** W02737 / 7870

LAB SAMPLE ID: JCTHD21B **MATRIX:** SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA/IDL	REPORT UNIT	YIELD	METHOD NUMBER
STRONTIUM	-7.30E-03	U	4.1E-02	4.1E-02	1.11E-01	pCi/g	94.70%	RICHRC5006

Number of Results: 1

0016

Quanterra

LABORATORY CONTROL SAMPLE

LAB NAME:	**QUANTERRA, Richland**	**SDG: /RPT GRP:**	W02737 / 7870
LAB SAMPLE ID:	CV63J22M	**MATRIX:**	SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
CS-137	8.84E-01		1.2E-01	1.2E-01	7.85E-02	pCi/g	N/A	9.53E-01	92.79%
RA-226	1.57E+00		2.2E-01	2.2E-01	1.38E-01	pCi/g	N/A	2.14E+00	73.47%

Number of Results: 2

0017

Quanterra

LABORATORY CONTROL SAMPLE

LAB NAME:	**QUANTERRA, Richland**	**SDG: /RPT GRP:**	W02737 / 7870
LAB SAMPLE ID:	CW0NA12S	**MATRIX:**	SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
NI-63	4.71E+02		7.3E+00	3.5E+01	5.15E+00	pCi/g	98.30%	6.09E+02	77.42%

Number of Results: 1

0018

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra

LABORATORY CONTROL SAMPLE

LAB NAME:	**QUANTERRA, Richland**	**SDG: /RPT GRP:**	W02737 / 7870
LAB SAMPLE ID:	JCTHCT1S	**MATRIX:**	SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
PU239/40	3.43E+00		2.9E-01	5.4E-01	2.42E-02	pCi/g	68.80%	3.39E+00	101.03%

Number of Results: 1

0019

Quanterra

LABORATORY CONTROL SAMPLE

LAB NAME:	**QUANTERRA, Richland**	**SDG: /RPT GRP:**	W02737 / 7870
LAB SAMPLE ID:	JCTHCV1S	**MATRIX:**	SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
AM-241	3.97E+00	J	2.4E-01	6.0E-01	1.66E-02	pCi/g	106.30%	4.53E+00	87.51%

Number of Results: 1

0020

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra

LABORATORY CONTROL SAMPLE

LAB NAME: QUANTERRA, Richland **SDG: /RPT GRP:** W02737 / 7870

LAB SAMPLE ID: JCTHCW1S **MATRIX:** SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
U-234	7.95E-01	J	1.2E-01	1.5E-01	2.43E-02	pCi/g	91.50%	8.62E-01	92.16%
U-235	5.28E-02	J	3.2E-02	3.2E-02	2.57E-02	pCi/g	91.50%	3.93E-02	134.13%
U-238	8.52E-01	J	1.2E-01	1.6E-01	3.12E-02	pCi/g	91.50%	9.03E-01	94.30%

Number of Results: 3

0021

Quanterra

LABORATORY CONTROL SAMPLE

LAB NAME:	**QUANTERRA, Richland**	**SDG: /RPT GRP:**	W02737 / 7870
LAB SAMPLE ID:	JCTHD21S	**MATRIX:**	SOIL

ANALYTE	RESULT	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/ IDL	REPORT UNIT	YIELD	EXPECTED	RECOVERY
STRONTIUM	5.82E+00		3.0E-01	2.2E+00	1.17E-01	pCi/g	95.10%	6.03E+00	96.50%

Number of Results: 1

0022

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra

MATRIX SPIKE RESULTS

LAB NAME:	**QUANTERRA, Richland**	**SDG: /RPT GRP:**	W02737 / 7870
LAB SAMPLE ID:	CTERK1FW	**MATRIX:**	SOIL

ANALYTE	SPIKE RESULT*	Q	COUNTING ERROR (2 s)	TOTAL ERROR (2 s)	MDA/IDL	REPORT UNIT	SAMPLE RESULT	EXPECTED	RECOVERY
NI-63	4.83E+02		8.3E+00	3.7E+01	6.62E+00	pCi/g	4.73E+00	6.07E+02	79.59%

Number of Results: 1

0023

*Spike Result Corrected For Sample Result

Result = IDL When Not Detecte

(Q)ualifiers: U = Analyte result < MDA/IDL,
J = No U qualifier and result < RDL.

Quanterra

Data Review Checklist
RADIOCHEMISTRY

Lot Number: J9D080212				
Client ID: BHI				
Due Date: 4-23-99				
QC Batch Number: 9102232		SDG Number: W02737		
Method Test Parameter: AM250				
Matrix: Soil				
Review Item	Yes (√)	No (√)	N/A (√)	2nd Level Review (√)
A. Calibration 1. Is the calibration documentation included where applicable?			✓	
B. Sample Analysis 1. Are the sample yields within acceptance criteria?	✓			✓
2. Were all sample holding times met?	✓			✓
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			✓
C. QC Samples 1. Is the blank yield within acceptance criteria?	✓			✓
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			✓
3. Does the blank result meet the Contract criteria?	✓			✓
4. Is the blank result < the Contract Detection Limit?	✓			✓
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			✓
7. Is the LCS yield within acceptance criteria?	✓			✓
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			✓
9. Do the MS/MSD results and yields meet acceptance criteria?			✓	✓
10. Do the duplicate sample results and yields meet acceptance criteria?	✓			✓
D. Other 1. Are all Nonconformances included and noted?			✓	
2. Are all required forms filled out?	✓			✓
3. Was the correct methodology used?	✓			✓
4. Was transcription checked? DM 4-28-99	✓			✓
5. Were all calculations checked at a minimum frequency?	✓			✓
6. Were units checked?	✓			✓

Comments on any "No" response: _____

First Level Review: Jacqueline Waddell Date: 4/29/99

Second Level Review: [signature] Date: 6/1/99

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Quanterra

Data Review Checklist
RADIOCHEMISTRY

Lot Number: 199080212				
Client ID: BHI				
Due Date: 4-23-99				
QC Batch Number: 910223 1		SDG Number: W92737		
Method Test Parameter: Plutonium				
Matrix: Soil				
Review Item	Yes (√)	No (√)	N/A (√)	2nd Level Review (√)
A. Calibration 1. Is the calibration documentation included where applicable?			✓	
B. Sample Analysis 1. Are the sample yields within acceptance criteria?	✓			✓
2. Were all sample holding times met?	✓			✓
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			✓
C. QC Samples 1. Is the blank yield within acceptance criteria?	✓			✓
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			✓
3. Does the blank result meet the Contract criteria?	✓			✓
4. Is the blank result < the Contract Detection Limit?	✓			✓
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			✓
7. Is the LCS yield within acceptance criteria?	✓			✓
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			✓
9. Do the MS/MSD results and yields meet acceptance criteria?			✓	
10. Do the duplicate sample results and yields meet acceptance criteria?	✓			✓
D. Other 1. Are all Nonconformances included and noted?			✓	
2. Are all required forms filled out?	✓			✓
3. Was the correct methodology used?	✓			✓
4. Was transcription checked? JM 4-27-99	✓			✓
5. Were all calculations checked at a minimum frequency?	✓			✓
6. Were units checked?	✓			✓

Comments on any "No" response: _____

First Level Review: Jacqueline Waddell Date: 4/27/99

Second Level Review: _____ Date: 6/1/99

Quanterra

Data Review Checklist
RADIOCHEMISTRY

Lot Number: J9D080212				
Client ID: BNI				
Due Date: 4-23-99				
QC Batch Number: 9102233			SDG Number: W02737	
Method Test Parameter: UISO				
Matrix: Soil				
Review Item	Yes (√)	No (√)	N/A (√)	2nd Level Review (√)
A. Calibration 1. Is the calibration documentation included where applicable?			✓	
B. Sample Analysis 1. Are the sample yields within acceptance criteria?	✓			✓
2. Were all sample holding times met?	✓			✓
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			✓
C. QC Samples 1. Is the blank yield within acceptance criteria?	✓			✓
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			✓
3. Does the blank result meet the Contract criteria?	✓			✓
4. Is the blank result < the Contract Detection Limit?	✓			✓
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			✓
7. Is the LCS yield within acceptance criteria?	✓			✓
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			✓
9. Do the MS/MSD results and yields meet acceptance criteria?			✓	
10. Do the duplicate sample results and yields meet acceptance criteria?	✓			✓
D. Other 1. Are all Nonconformances included and noted?			✓	
2. Are all required forms filled out?	✓			✓
3. Was the correct methodology used?	✓			✓
4. Was transcription checked? JM 4-23-99	✓			✓
5. Were all calculations checked at a minimum frequency?	✓			✓
6. Were units checked?	✓			✓

Comments on any "No" response: _____

First Level Review: Jacqueline Waddell Date: 4/26/99

Second Level Review: [signature] Date: 6/1/99

LS-038, Rev.5, 4/99

Quanterra

Data Review Checklist
RADIOCHEMISTRY

Lot Number: J9D080212				
Client ID: 127642 BH1				
Due Date: 4-23-99				
QC Batch Number: 9102234		SDG Number: 2737		
Method Test Parameter: Gamma				
Matrix: Soil				
Review Item	Yes (√)	No (√)	N/A (√)	2nd Level Review (√)
A. Calibration 1. Is the calibration documentation included where applicable?			✓	
B. Sample Analysis 1. Are the sample yields within acceptance criteria?			✓	
2. Were all sample holding times met?			✓	
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓	✓		✓
C. QC Samples 1. Is the blank yield within acceptance criteria?			✓	
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			✓
3. Does the blank result meet the Contract criteria?	✓			✓
4. Is the blank result < the Contract Detection Limit?	✓			✓
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓	✓		✓
7. Is the LCS yield within acceptance criteria?			✓	
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓	✓		✓
9. Do the MS/MSD results and yields meet acceptance criteria?			✓	
10. Do the duplicate sample results and yields meet acceptance criteria?	✓			✓
D. Other 1. Are all Nonconformances included and noted? 1 NCM	✓			✓
2. Are all required forms filled out?	✓			✓
3. Was the correct methodology used?	✓			✓
4. Was transcription checked?	✓			✓
5. Were all calculations checked at a minimum frequency?	✓			✓
6. Were units checked?	✓			✓

Comments on any "No" response: ~~SEE~~ NCM

First Level Review: _____ Date: 4/27/99

Second Level Review: _____ Date: 6/1/99

LS-038, Rev.5, 4/99

0027

QUANTERRA LABORATORY NONCONFORMANCE MEMO (NCM)

LOG #: RD-99-178

Project ID: J9D080212 NCM Initiated by: JD Connell

Sample Numbers: 9118242 / 9102234

Tests: Gamma

Matrix: Soil

Analytical Area (check appropriate area):

☐ Sample control	☐ GC	☐ Wet chemistry	☐ Data review
☐ Organic preparation	☐ HPLC	☐ Metals	☒ Radiochemistry
☐ Inorganic preparation	☐ GC/MS	☒ Reporting	☐ Bioassay

Nonconformance (check appropriate area):

Holding Time Violations (exceeded by _____ days)

Category I: Laboratory Independent

- ☐ 1. Holding time expired in transit
- ☐ 2. Sample received > 48 hrs. or 1/2 holding time has expired
- ☐ 3. Test added by client after expiration

Category II: Laboratory Dependent

- ☐ 4. Instrument failure
- ☐ 5. Analyst error
- ☐ 6. Login error
- ☐ 7. Miscommunication
- ☐ 8. Other (complete description required)

Category III: Analysis Reruns (QA/QC)

- ☐ 9. Surrogates
- ☐ 10. Internal Standards
- ☐ 11. Spike Recoveries
- ☐ 12. Blank Contamination

Category IV: Analysis Reruns (Confirmation)

- ☐ 13. Second column
- ☐ 14. Contamination check
- ☐ 15. Confirmation of matrix effects
- ☐ 16. Other (complete description required)

Quality Assurance/Quality Control

- ☐ 17. QC data reported outside of controls
- ☐ 18. Incorrect procedure used
- ☐ 19. SOP intentionally modified with QA and Tech. approval
- ☐ 20. Invalid instrument calibration
- ☐ 21. Insufficient sample received for proper analysis

Incorrect or Incomplete Client Deliverable

- ☐ 22. Hardcopy deliverable error
- ☐ 23. Electronic deliverable error

Reported detection limits elevated due to:

- ☐ 24. Sample matrix
- ☐ 25. Insufficient sample volume
- ☐ 26. Other (complete description required)
- ☐ 27. *Other (specify):* Sample identification suffixes were changed.

Comments/Explanation: _____

Notification (check appropriate area):

Client notified by (name and date): _____

- ☒ in writing (FAX)
- ☐ by facsimile
- ☐ by telephone
- ☐ other (explain)

Client's name and response: _____

- ☐ process "as is"
- ☐ re-sample
- ☐ on hold until _____
- ☐ other (explain)

Project Manager (signature and date): [signature] 6/8/99

0027A

QUANTERRA LABORATORY NONCONFORMANCE MEMO (NCM)

LOG#: RD-99-

Corrective Action

Root Cause Initial and date: DK 6-2-99

Structured Analysis Code Incorrect upon Receipt of Samples. Initial Batch deleted (9102234) And Samples logged in with Correct SAC, which necessitated Suffix Change.

Corrective Action Initial and Date: DK 6-2-99

Reported Sample IDs Tested to Orginal Sample IDs. CTERK 100=CTERK 101. Dup: CTERK 109 = CTERK 10E. Blank: CV63J 101 B = CTHD0101. LCS: CV63J 102 = CTHD0 102. Report Data from VAX instead of Bap Calc.

Responsibility for performing CA assigned to:

Actions to prevent recurrence Initial and Date:

SAC has been corrected

First Level Supervisor: Date: 6-2-99

Responsible Manager: Date: 6/8/99

Quality Assurance Review

☐ Anomaly ☒ Deficiency ☐ Rerun

☐ Further action required:

Assigned to:

QA signature: Date: 6/8/99

Corrective Action Verification

☐ Verified

☐ Cannot Verify (specify reason):

Nonconformance Memo Closure

QA signature/date: 6/8/99

00273

QUANTERRA LABORATORY NONCONFORMANCE MEMO (NCM)

LOG #: RD-99-177

Project ID: J9D080212 NCM Initiated by: D. O'Connell

Sample Numbers: 910234

Tests: Gamma

Matrix: Soil WO2737

Analytical Area (check appropriate area):

- ☐ Sample control
- ☐ Organic preparation
- ☐ Inorganic preparation
- ☐ GC
- ☐ HPLC
- ☐ GC/MS
- ☐ Wet chemistry
- ☐ Metals
- ☐ Reporting
- ☒ Data review
- ☒ Radiochemistry
- ☐ Bioassay

Nonconformance (check appropriate area):

Holding Time Violations (exceeded by _____ days)

Category I: Laboratory Independent

- ☐ 1. Holding time expired in transit
- ☐ 2. Sample received > 48 hrs. or 1/2 holding time has expired
- ☐ 3. Test added by client after expiration

Category II: Laboratory Dependent

- ☐ 4. Instrument failure
- ☐ 5. Analyst error
- ☐ 6. Login error
- ☐ 7. Miscommunication
- ☐ 8. Other (complete description required)

Category III: Analysis Reruns (QA/QC)

- ☐ 9. Surrogates
- ☐ 10. Internal Standards
- ☐ 11. Spike Recoveries
- ☐ 12. Blank Contamination

Category IV: Analysis Reruns (Confirmation)

- ☐ 13. Second column
- ☐ 14. Contamination check
- ☐ 15. Confirmation of matrix effects
- ☐ 16. Other (complete description required)

Quality Assurance/Quality Control

- ☐ 17. QC data reported outside of controls
- ☐ 18. Incorrect procedure used
- ☐ 19. SOP intentionally modified with QA and Tech. approval
- ☐ 20. Invalid instrument calibration
- ☐ 21. Insufficient sample received for proper analysis

Incorrect or Incomplete Client Deliverable

- ☐ 22. Hardcopy deliverable error
- ☐ 23. Electronic deliverable error

Reported detection limits elevated due to:

- ☒ 24. Sample matrix
- ☒ 25. Insufficient sample volume
- ☐ 26. Other (complete description required)
- ☒ 27. *Other (specify):* BLANK & Spike SWITCHED IN Count Room; REReported per PM

Comments/Explanation: MDA > COL: Sample CTERK101, isotope Eu 154 & duplicate CTERK109, MDA > RDL for Co-60, Eu-152, -154 & 155 on matrix spike CTHD0102. Additionally Ra-226 recovery @ 60% on spike

Notification (check appropriate area):

Client notified by (name and date): _____

- ☒ in writing CW
- ☐ by facsimile
- ☐ by telephone
- ☐ other (explain)

Client's name and response:

- ☐ process "as is"
- ☐ re-sample
- ☐ on hold until
- ☐ other (explain)

Project Manager (signature and date): [signature] 4/19/99

00276

QUANTERRA LABORATORY NONCONFORMANCE MEMO (NCM)

LOG#: RD-99-_____

Corrective Action

Root Cause Initial and date: DLC 4-27-99

Counting statistics, insufficient sample, sample matrix.

Corrective Action Initial and Date: DLC 4-27-99

MDA met for all isotopes on the Blank, Dups agree, but Spike Ra-226 out of tolerance. Recount Spike Ra-226 w/in tolerance, data accepted DLC 4-29-99

Responsibility for performing CA assigned to: _____

Actions to prevent recurrence Initial and Date: _____

One time occurrence.

First Level Supervisor: _____ Date: 4-27-99

Responsible Manager: _____ Date: 6/8/99

Quality Assurance Review

☐ Anomaly ☒ Deficiency ☐ Rerun

☐ Further action required: _____

Assigned to: _____

QA signature: _____ Date: 6/8/99

Corrective Action Verification

☒ Verified

☐ Cannot Verify (specify reason): _____

Nonconformance Memo Closure

QA signature/date: _____ 6/8/99

0027D

Quanterra

Data Review Checklist
RADIOCHEMISTRY

Lot Number: J9D08 0212				
Client ID: 127642				
Due Date: 4-23-99				
QC Batch Number: 9118242			SDG Number: 2737	
Method Test Parameter: Gamma				
Matrix: Soil				
Review Item	Yes (√)	No (√)	N/A (√)	2nd Level Review (√)
A. Calibration 1. Is the calibration documentation included where applicable?			✓	
B. Sample Analysis 1. Are the sample yields within acceptance criteria?			✓	
2. Were all sample holding times met?			✓	
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			✓
C. QC Samples 1. Is the blank yield within acceptance criteria?			✓	
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?			✓	
3. Does the blank result meet the Contract criteria?			✓	
4. Is the blank result < the Contract Detection Limit?			✓	
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			✓
7. Is the LCS yield within acceptance criteria?			✓	
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			✓
9. Do the MS/MSD results and yields meet acceptance criteria?			✓	
10. Do the duplicate sample results and yields meet acceptance criteria?			✓	
D. Other 1. Are all Nonconformances included and noted?			✓	✓
2. Are all required forms filled out?	✓			✓
3. Was the correct methodology used?	✓			✓
4. Was transcription checked?	✓			✓
5. Were all calculations checked at a minimum frequency?	✓			✓
6. Were units checked?	✓			✓

Comments on any "No" response: Report Recount Data

First Level Review: _____ Date: 4-29-99

Second Level Review: _____ Date: _____

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Quanterra

Data Review Checklist
RADIOCHEMISTRY

2737

Lot Number: J9D080212				
Client ID: BHI				
Due Date: 4-23-99				
QC Batch Number: 910235	SDG Number:			
Method Test Parameter: Total SR				
Matrix: Soil				
Review Item	Yes (√)	No (√)	N/A (√)	2nd Level Review (√)
A. Calibration 1. Is the calibration documentation included where applicable?			✓	
B. Sample Analysis 1. Are the sample yields within acceptance criteria?	✓			✓
2. Were all sample holding times met?	✓			✓
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	✓			✓
C. QC Samples 1. Is the blank yield within acceptance criteria?	✓			✓
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	✓			✓
3. Does the blank result meet the Contract criteria?	✓			✓
4. Is the blank result < the Contract Detection Limit?	✓			✓
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			✓	
6. Is the LCS result within acceptance criteria?	✓			✓
7. Is the LCS yield within acceptance criteria?	✓			✓
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	✓			
9. Do the MS/MSD results and yields meet acceptance criteria?			✓	
10. Do the duplicate sample results and yields meet acceptance criteria?	✓			✓
D. Other 1. Are all Nonconformances included and noted?			✓	
2. Are all required forms filled out?	✓			✓
3. Was the correct methodology used?	✓			✓
4. Was transcription checked? DM 4-21-99	✓			✓
5. Were all calculations checked at a minimum frequency?	✓			✓
6. Were units checked?	✓			✓

Comments on any "No" response: _____

First Level Review: Jacqueline Waddell Date: 4/22/99

Second Level Review: [signature] Date: 6/1/99

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Data Review Checklist

RADIOCHEMISTRY

Lot Number:	J9D080212
Client ID:	BHI
Due Date:	4/23/99
QC Batch Number:	9139411 SDG Number:
Method Test Parameter:	PU03
Matrix:	Soil

Review Item	Yes (√)	No (√)	N/A (√)	2nd Level Review (√)
A. Calibration 1. Is the calibration documentation included where applicable?			√	
B. Sample Analysis 1. Are the sample yields within acceptance criteria?	√			√
2. Were all sample holding times met?	√			√
3. Is the sample Minimum Detectable Activity < the Contract Detection Limit?	√			√
C. QC Samples 1. Is the blank yield within acceptance criteria?	√			√
2. Is the Minimum Detectable Activity for the blank result ≤ the Contract Detection Limit?	√			√
3. Does the blank result meet the Contract criteria?	√			√
4. Is the blank result < the Contract Detection Limit?	√			√
5. Is the blank result > the Contract Detection Limit but the sample result < the Contract Detection Limit?			√	
6. Is the LCS result within acceptance criteria?	√			√
7. Is the LCS yield within acceptance criteria?	√			√
8. Is the LCS Minimum Detectable Activity ≤ the Contract Detection Limit?	√			√
9. Do the MS/MSD results and yields meet acceptance criteria?	√			√
10. Do the duplicate sample results and yields meet acceptance criteria?	√			√
D. Other 1. Are all Nonconformances included and noted?			√	
2. Are all required forms filled out?	√			√
3. Was the correct methodology used?	√			√
4. Was transcription checked?	√			√
5. Were all calculations checked at a minimum frequency?	√			√
6. Were units checked?	√			√

Comments on any "No" response: _____

First Level Review: _____ Date: 4/28/99

Second Level Review: _____ Date: 4/1/99

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CHAIN OF

CUSTODY FORMS

X-2108

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-002-76 | Page 1 of 1

Collector Fahlberg/Coffman	**Company Contact** R Coffman **Telephone No.** 373-6425	**Project Coordinator** TRENT, SJ	**Price Code** / **Data Turnaround** 15 Days
Project Designation 100 BC Areas - Full Protocol	**Sampling Location** 100 B/C 116-B-12 shallow zone	**SAF No.** B99-002	
Ice Chest No. ERC99-004	**Field Logbook No.** EL 1327-2	**Method of Shipment** Gov vehicle	
Shipped To Quanterra Incorporated	**Offsite Property No.**	**Bill of Lading/Air Bill No.**	
		COA	

POSSIBLE SAMPLE HAZARDS/REMARKS DLH H-23

Special Handling and/or Storage

SDG W02737

SAMPLE ANALYSIS J9D080212

	Preservation	None	None	None	None						
	Type of Container	aG	aG	aG	Marinelli						
	No. of Container(s) / Volume	1 / 60mL	1 / 60mL	1 / 250mL	1 / 500mL						
		Activity Scan	See item (1) in Special Instructions.	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions.						
Sample No.	Matrix *	Sample Date	Sample Time								
B0V1X1 CTERK	Soil	4-6-99	1010	X	X	X	X					B0V1R8

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By R.Fahlberg / R.Fahlberg	Date/Time 1625 4/6/99	Received By Ref: 1-C	Date/Time 1625 4.6.99
Relinquished By Ref 1-C	Date/Time 4/8/99 1330	Received By Bruce Nelson / R. Nielson	Date/Time 1330 4-8-99
Relinquished By R. Nielson / R. Nielson 4-8-99	Date/Time 1350	Received By Heidelberg	Date/Time 4-8-99 1350
Relinquished By	Date/Time	Received By Lloopy	Date/Time

SPECIAL INSTRUCTIONS

(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63

(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

R. Fahlberg unavailable to relinquish samples

Matrix *
Soil
Water
Vapor
Other Solid
Other Liquid

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

ERC Radiological Counting Facility Analysis Report

RCF Number RCF5628

Sample Date & Time 3/26/99 0940

Project ID: 116-B-12 SAF Number: B99-001 Date Analyzed 3/29/99

Sample ID: B0V1R8

A1-03

B0V1X4

Gamma Energy Analysis

Nuclide		Activity (pCi/g)		Error (pCi/g)
K-40		1.43E+01	+/-	1.46
Co-60		7.02E-02	+/-	2.75
Cs-137		3.78E-02	+/-	2.38
Eu-152		1.75E-01	+/-	5.80
Eu-154	<	4.02E-02		
Eu-155	<	8.96E-02		
Th-232d	<	3.32E-01		
U-235	<	2.60E-01		
Np-237	<	3.80E-02		
U-238d		4.96E-01	+/-	9.81
U-238		4.16E+00	+/-	4.12
Am-241	<	7.38E-02		

Total GEA (pCi/g)	1.9E+01	+/-	5.80

	Activity (pCi/g)		Error (pCi/g)
Gross Alpha**	N/R	+/-	N/R
Gross Beta	N/R	+/-	N/R

Definitions:

All errors reported at 2 standard deviations.
N/R = no result or analysis not requested. <MDA = Less than detection limit.
All GEA results reported as "<" list the MDA value for that radionuclide.
Rounding error may result in the reported total GEA activity differing from the sum of the > MDA GEA values in the second significant digit.

For soils and natural samples, the following applies:

The analysis of U-238 is based on the activity of Pa-234m.
The analysis of Np-237 is based on the activity of Pa-233.
U-238dau is the activity of Pb-214 and Bi-214, short lived daughter products of U-238. Equilibrium between parent and daughter products probably does not exist in disturbed materials.
Th-232dau is the activity of Ac-228, Pb-212, and Tl-208, short lived daughter products of Th-232. Equilibrium between parent and daughter products may not exist in disturbed materials.
Other samples, not containing natural materials, may have inapplicable results for the Th, U, transuranics and daughter products.
The results must then be balanced for the gross alpha analysis.
**The gross alpha results are not corrected for mass absorbtion

Analysist David Brehm 3/29/99

Report To Randy Coffman

Fax 373-9779

Report Printed: Monday, March 29, 1999

0033

Figure 1

SAMPLE CHECK-IN LIST

Date/Time Received: 4/8 1350 SG#: W02737

Work Order Number: J9D080212 SAF #: B99-002

Shipping Container ID: 99-004 Chain of Custody # B99-002-76

1. Custody Seals on shipping container intact? Yes [✓] No [ ]
2. Custody Seals dated and signed? Yes [✓] No [ ]
3. Chain-of-Custody record present? Yes [✓] No [ ]
4. Cooler temperature 3°
5. Vermiculite/packing materials is Wet [ ] Dry [✓] na
6. Number of samples in shipping container: 4
7. Sample holding times exceeded? Yes [ ] No [✓]

8. Samples have:
   - ✓ tape
   - ✓ custody seals
   - ____ hazard labels
   - ____ appropriate sample labels

9. Samples are:
   - ✓ in good condition
   - ____ broken
   - ____ leaking
   - ____ have air bubbles

10. Where any anomalies identified in sample receipt? Yes [ ] No [✓]
11. Description of anomalies (include sample numbers): _____

Sample Custodian/Laboratory: Heidelberg Date: 4-8-99

Telephoned To: _____ On _____ By _____

Client Sample Screening Results

08-Apr-99

4/8/99

CLIENT CODE ID	MATRIX	RECEIVED	DETECTOR	ACQ DATE	SAMPLE	MINUTES	CNTS A	NET CPM A	CNTS B	NET CPM B
BHI B0M4L3		4/8/99 1:53:00 PM	QUAD21A	4/8/99 3:12:17 PM	B0M4L3	30	29	0.907916667	1114	36.0945833
CTER0	LIQUID		Bkg:	4/8/99 5:39:23 AM	BKG	800	47	0.05875	831	1.03875

Anl Date: 4/8/99	Tot Sa, Alq: 5.00E-01	, 1.00E+01	Alp;	(Dpm/ 1.48E+00	(uCi/ 3.34E-05	(pCi/ 6.68E+01	± 2.6E+01	CAT	3.7E-01	Lab
Ppt mg: 1.5 ✓	Units: L ✓	, ml	Bet;	Alq): 7.16E+01	Sa): 1.61E-03	L|g): 3.23E+03	± 9.9E+01	I ✓	1.6E-02	Alq L|g

BHI B0M4L4		4/8/99 1:53:00 PM	QUAD21B	4/8/99 3:12:17 PM	B0M4L4	30	19	0.569583333	314	9.48416667
CTER1	LIQUID		Bkg:	4/8/99 5:39:23 AM	BKG	800	51	0.06375	786	0.9825

Anl Date: 4/8/99	Tot Sa, Alq: 5.00E-01	, 1.00E+01	Alp;	(Dpm/ 1.50E+00	(uCi/ 3.37E-05	(pCi/ 6.74E+01	± 2.6E+01	CAT	3.7E-01	Lab
Ppt mg: 1 ✓	Units: L ✓	, ml	Bet;	Alq): 1.80E+01	Sa): 4.06E-04	L|g): 8.12E+02	± 5.1E+01	I ✓	6.2E-02	Alq L|g

BHI B0V1X1		4/8/99 1:53:00 PM	QUAD21C	4/8/99 3:12:17 PM	B0V1X1	30	13	0.357083333	105	2.54625
CTERK	SOIL		Bkg:	4/8/99 5:39:23 AM	BKG	800	61	0.07625	763	0.95375

Anl Date: 4/8/99	Tot Sa, Alq: 1.41E+02 ✓	, 8.90E+01	Alp;	(Dpm/ 2.20E+00	(uCi/ 1.56E-03	(pCi/ 1.11E+01	± 5.9E+00	CAT ✓	4.5E+00	Lab
Ppt mg: 89 ✓	Units: g	, mg	Bet;	Alq): 5.43E+00	Sa): 3.86E-03	L|g): 2.75E+01	± 3.8E+00	I	3.6E+00	Alq L|g

Quanterra

COC Signature Page

Batch #: WO2737 9102232

	Initials/Date	Procedure #
Released By	~~KBT~~ 4/12-99	RICHRC0009
Received	TAL 4/12/99	RICHRC5013
Released By	TAL 4/13/99	n/a
Received	SK 4/13/99	RC 5019
Released By	SK 4/17/99	n/a
Received	4/21/99	RICHRC5080
Released By	~~4/23/99~~ 4-26-99	n/a
Received	LOL 4-26-99	cpptn 4.26-99 RICHRC5003
Released By	LOL 4-26-99	n/a
Received	4/26/99	RICHRC0008
Released By	4/21/99	n/a
Received	JM 4-27-99	RICHRC5013
Released By	JM 4-28-99	n/a
Received	JW 4/28/99	RICHRC0002
Released	JW 4/29/99	

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RQC053

Quanterra Incorporated
RAD PREP BENCH WORKSHEET

Run Date: 4/12/99
Time: 10:53:02

Prep	Sep1	Sep2	
____	____	____	Samples Covered
____	____	____	Labware Labeled
____	____	____	Verify Test/Container
____	____	____	Samples Ordered Sequentially
____	____	____	Logbooks Entered

****
* *
* QC BATCH: 9102232 *
* *
****

W0227-37

Prep Dt/Tm/Person: 4/12/99 0
Sep1 Dt/Tm/Person: 0/00/00 00000
Sep2 Dt/Tm/Person: 0/00/00 00000
Cocktail Date/Time: 0/00/00

SX: Americium-241 by Alpha Spec
6I: PuAm PrpRC5013/RC5019, SepRC5080(5003)/RC5010(5039)
5I: RCH: HANFORD ANALYTICAL

ANL DUE	LOT#,MSRUN#/ WORK ORDER	CLIENT MATRIX	INIT/ FINAL	DISH	GEOM	PPT1WT	pH	COUNT TIME	MID/AVE DATE/TIME	TRACER ID/ SPIKE ID	CRDL	UNITS
4/23/99	J9D080212-001 **CTERK-1-05**	SOLID									1	pCi/g
4/23/99	J9D080212-001 **CTERK-1-07X**	SOLID		JCTERK1R							1	pCi/g
0/00/00	J9D120000-232 **CTHCV-1-01B**	SOLID		JCTHCV1B							1	pCi/g
0/00/00	J9D120000-232 **CTHCV-1-02C**	SOLID		JCTHCV1S							1	pCi/g

NUMBER OF WORK ORDERS IN BATCH: 4

PRIORITY

0037

Quanterra

COC Signature Page

WO 27757

Batch #: 9102231

	Initials/Date	Procedure #
Released By	TAL 4-12-99	RICHRC0009
Received	TAL 4/12/99	RICHRC5013
Released By	TAL 4/13/99	n/a
Received	SIC 4/13/99	RC5019
Released By	SIC 4/17/99	n/a
Received	(S) 4/19/99	RICHRC5080
Released By	(S) 4/22/99	n/a
Received	LQ 4-23-99	ed'd 4-23-99 RICHRC5039.1
Released By	LQ 4-23-99	n/a
Received	4/23/99	RICHRC5039
Released By	4/26/99	n/a
Received	JM 4-27-99	RICHRC5003
Released By	JM 4-27-99	n/a
Received	JN 4/27/99	RICHRC0002/2
Released	JN 4/27/99	

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RQC053

Quanterra Incorporated
RAD PREP BENCH WORKSHEET

Run Date: 4/12/99
Time: 10:52:02

Prep	Sep1	Sep2	
____	____	____	Samples Covered
____	____	____	Labware Labeled
____	____	____	Verify Test/Container
____	____	____	Samples Ordered Sequentially
____	____	____	Logbooks Entered

****
* *
* QC BATCH: 9102231 *
* *
****

WO27737

Prep Dt/Tm/Person: 4/12/99 0
Sep1 Dt/Tm/Person: 0/00/00 00000
Sep2 Dt/Tm/Person: 0/00/00 00000
Cocktail Date/Time: 0/00/00

SO: Plutonium-238,239/40 by Alpha Spec
6I: PuAm PrpRC5013/RC5019, SepRC5080(5003)/RC5010(5039)
5I: RCH: HANFORD ANALYTICAL

ANL DUE	LOT#,MSRUN#/ WORK ORDER	CLIENT MATRIX	INIT/ FINAL	DISH	GEOM	PPT1WT	pH	COUNT TIME	MID/AVE DATE/TIME	TRACER ID/ SPIKE ID	CRDL	UNITS
4/23/99	J9D080212-001 **CTERK-1-04**	SOLID									1	pCi/g
4/23/99	J9D080212-001 **CTERK-1-06X**	SOLID		JCTERK1R							1	pCi/g
0/00/00	J9D120000-231 **CTHCT-1-01B**	SOLID		JCTHCT1B							1	pCi/g
0/00/00	J9D120000-231 **CTHCT-1-02C**	SOLID		JCTHCT1S							1	pCi/g

NUMBER OF WORK ORDERS IN BATCH: 4

PRIORITY

0039

Quanterra

COC Signature Page

Batch #: WO2737 9102233

	Initials/Date	Procedure #
Released By	4-12-99	Richrc0009
Received	TAR 4/12/99	RCHRC5013
Released By	TAR 4/13/99	n/a
Received	SK 4/13/99	RC 5C19 SK 4/13/99
Released By	SK 4/16/99	n/a
Received	4/19/99	RICHR<5079
Released By	4/19/99	n/a
Received	Cd 4-20-99 Extracted 4-20-99	RICHRC5036
Released By	CA 4-20-99 Edd 4-21-99 RICHRC5091	n/a
Received	4/21/99	RICHRC0001
Released By	4/22/99	n/a
Received	JM 4-23-99	RICHRS 5003
Released By	JM 4-23-99	n/a
Received	4/23/99	RICHRC00012
Released	4/26/99	

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0040

RQC053

Quanterra Incorporated
RAD PREP BENCH WORKSHEET

Run Date: 4/12/99
Time: 10:54:03

Prep	Sep1	Sep2	
____	____	____	Samples Covered
____	____	____	Labware Labeled
____	____	____	Verify Test/Container
____	____	____	Samples Ordered Sequentially
____	____	____	Logbooks Entered

****
* *
* **QC BATCH: 9102233** *
* *
****

W02737

Prep Dt/Tm/Person: 4/12/99 0
Sep1 Dt/Tm/Person: 0/00/00 000000
Sep2 Dt/Tm/Person: 0/00/00 000000
Cocktail Date/Time: 0/00/00

SR: Uranium-234,235,238 by Alpha Spec
7S: UIso PrpRC5013/RC5019, SepRC5079(5039)
5I: RCH: HANFORD ANALYTICAL

ANL DUE	LOT#,MSRUN#/ WORK ORDER	CLIENT MATRIX	INIT/ FINAL	DISH	GEOM	PPT1WT	pH	COUNT TIME	MID/AVE DATE/TIME	TRACER ID/ SPIKE ID	CRDL	UNITS
4/23/99	J9D080212-001 **CTERK-1-02**	SOLID									1	pCi/g
4/23/99	J9D080212-001 **CTERK-1-08X**	SOLID		JCTERK1R							1	pCi/g
0/00/00	J9D120000-233 **CTHCW-1-01B**	SOLID		JCTHCW1B							1	pCi/g
0/00/00	J9D120000-233 **CTHCW-1-02C**	SOLID		JCTHCW1S							1	pCi/g

NUMBER OF WORK ORDERS IN BATCH: 4

PRIORITY

0041

Quanterra

COC Signature Page

W027737

Batch #: 91022234

	Initials/Date	Procedure #
Released By	KKA 4-12-99	Richrc0009
Received	TAL 4/12/99	RKHRC5013/5017
Released By	TAL 4/13/99	n/a
Received	CB 4/13/99	RICHRd0007
Released By	CB 4/26/99	n/a
Received	TDK 4-26-99	RCHREC0002-2
Released By	TDK 4-27-99	n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		

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RQC053

Quanterra Incorporated
RAD PREP BENCH WORKSHEET

Run Date: 4/28/99
Time: 11:44:18

Prep	Sep1	Sep2	
____	____	____	Samples Covered
____	____	____	Labware Labeled
____	____	____	Verify Test/Container
____	____	____	Samples Ordered Sequentially
____	____	____	Logbooks Entered

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* *
* QC BATCH: 9118242 *
* *
****

W0827S7

Prep Dt/Tm/Person:	4/28/99	0	
Sep1 Dt/Tm/Person:	0/00/00	00000	
Sep2 Dt/Tm/Person:	0/00/00	00000	
Cocktail Date/Time:	0/00/00		

T9: Gamma by HPGE 10 day ingrowth
AX: Gamma PrpRC5013/5017
5I: RCH: HANFORD ANALYTICAL

ANL DUE	LOT#,MSRUN#/ WORK ORDER	CLIENT MATRIX	INIT/ FINAL	DISH	GEOM	PPT1WT	pH	COUNT TIME	MID/AVE DATE/TIME	TRACER ID/ SPIKE ID	CRDL	UNITS
4/23/99	J9D080212-001 **CTERK-1-0D**	SOLID										pCi/g
4/23/99	J9D080212-001 **CTERK-1-0EX**	SOLID		JCTERK1R								pCi/g
0/00/00	J9D280000-242 **CV63J-1-01B**	SOLID		JCV63J1B	(JCTHD01B)							pCi/g
0/00/00	J9D280000-242 **CV63J-1-02C**	SOLID		JCV63J1S	(JCTHD01S)							pCi/g

PRIORITY

NUMBER OF WORK ORDERS IN BATCH: 4

0043

Quanterra

COC Signature Page

9118242

Batch #: ~~9102234~~ DRC 4-29-99 OLD 9102234

	Initials/Date	Procedure #
Released By	DRC 4-27-99	RICHREC0002-2
Received	RB 4-27-99	RICHRD0007 R.1
Released By	RB 4/28/99	n/a
Received	DRC 4-28-99	RICHREC0002-2
Released By	DRC 4-29-99	n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		
Released By		n/a
Received		

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0044

Quanterra

DUE DATE 4-23-99

*** REANALYSIS REQUEST ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD LOT# J9D080212

CUSTOMER 127642 : 841

ANALYSIS Gamma

MATRIX Soil

SAMPLE DELIVERY GROUP 2737A

OLD BATCH NUMBER 910234

NEW BATCH NUMBER HA-911824

DUE 4-29-99

	LAB SAMPLE ID	CUSTOMER ID	COMMENTS
1)		CTH00 102	Ra-226 @ 609
2)			
3)		CTERK 101 for	BATCHING purposes only
4)			
5)			
6)			
7)			
8)			
9)			
10)			
11)			
12)			
13)			
14)			
15)			
16)			
17)			
18)			
19)			
20)			

RQC053

Quanterra Incorporated
RAD PREP BENCH WORKSHEET

Run Date: 4/28/99
Time: 11:53:33

Prep	Sep1	Sep2	
____	____	____	Samples Covered
____	____	____	Labware Labeled
____	____	____	Verify Test/Container
____	____	____	Samples Ordered Sequentially
____	____	____	Logbooks Entered

****
* *
* QC BATCH: 9118242 *
* *
****

W027737

Prep Dt/Tm/Person: 4/28/99 0
Sep1 Dt/Tm/Person: 0/00/00 000000
Sep2 Dt/Tm/Person: 0/00/00 000000
Cocktail Date/Time: 0/00/00

T9: Gamma by HPGE 10 day ingrowth
AX: Gamma PrpRC5013/5017
5I: RCH: HANFORD ANALYTICAL

ANL DUE	LOT#,MSRUN#/ WORK ORDER	CLIENT MATRIX	INIT/ FINAL	DISH	GEOM	PPT1WT	pH	COUNT TIME	MID/AVE DATE/TIME	TRACER ID/ SPIKE ID	CRDL	UNITS
4/23/99	J9D080212-001 **CTERK-1-0D**	SOLID										pCi/g
4/23/99	J9D080212-001 **CTERK-1-0EX**	SOLID		JCTERK1R								pCi/g
0/00/00	J9D280000-242 **CV63J-1-01B**	SOLID		JCV63J1B	(JCTHD01B)							pCi/g
0/00/00	J9D280000-242 **CV63J-1-02C**	SOLID		JCV63J1S	(JCTHD01S)							pCi/g
0/00/00	J9D280000-242 **CV63J-2-02C**	SOLID		JCV63J2S	(JCV63J1S)							pCi/g

NUMBER OF WORK ORDERS IN BATCH: 5

Quanterra

COC Signature Page

WO2737

Batch #: 9102235

	Initials/Date	Procedure #
Released By	[illegible] 4-12-99	RichRC0009
Received	JAL 4/12/99	RICHRC5013
Released By	JAL 4/13/99	n/a
Received	SK 4/13/99	RC 5013
Released By	SK 4/14/99	n/a
Received	RTM 4/15/99	RichRC5006/2
Released By	RTM 4/20/99	n/a
Received	CB 4/20/99	RICHRD0023
Released By	CB 4/20/99	n/a
Received	JM 4-21-99	RICHRS 5001
Released By	JM 4-21-99	n/a
Received	4/21/99	RICHRC0002/2
Released By	4/22/99	n/a
Received		

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RQC053

Quanterra Incorporated
RAD PREP BENCH WORKSHEET

Run Date: 4/12/99
Time: 10:56:07

Prep	Sep1	Sep2	
____	____	____	Samples Covered
____	____	____	Labware Labeled
____	____	____	Verify Test/Container
____	____	____	Samples Ordered Sequentially
____	____	____	Logbooks Entered

QC BATCH: 9102235

WO#8737

Prep Dt/Tm/Person: 4/12/99 0
Sep1 Dt/Tm/Person: 0/00/00 000000
Sep2 Dt/Tm/Person: 0/00/00 000000
Cocktail Date/Time: 0/00/00

TH: Total Strontium by GPC
CH: Sr-Total PrpRC5013, SepRC5006
5I: RCH: HANFORD ANALYTICAL

ANL DUE	LOT#,MSRUN#/ WORK ORDER	CLIENT MATRIX	INIT/ FINAL	DISH	GEOM	PPT1WT	pH	COUNT TIME	MID/AVE DATE/TIME	TRACER ID/ SPIKE ID	CRDL	UNITS
4/23/99	J9D080212-001 **CTERK-1-0AX**	SOLID		JCTERL1R							1	pCi/g
4/23/99	J9D080212-001 **CTERK-1-03**	SOLID									1	pCi/g
0/00/00	J9D120000-235 **CTHD2-1-01B**	SOLID		JCTHD21B							1	pCi/g
0/00/00	J9D120000-235 **CTHD2-1-02C**	SOLID		JCTHD21S							1	pCi/g

NUMBER OF WORK ORDERS IN BATCH: 4

PRIORITY

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Quanterra

COC Signature Page

Batch #: 9139411	Initials/Date	Procedure #
Released By	KBB 5/22/99	Richrd0009
Received	SK 5/22/99	RC5019
Released By	SK ~~5/22/99~~ 5/25/99 SK	n/a
Received	RB 5/25/99	RICHRC5069
Released By	RB 5/27/99	n/a
Received	ml 5/27/99	RICHRD0001
Released By	ml 5/28/99	n/a
Received	(R) 5/28/99	RICHMT5002
Released By	(R) 5/28/99	n/a
Received	TAL 5/28/99	RICHRC0002/2
Released By	TAL 5/28/99	n/a
Received Data Review	ffl 6/1/99	RICHRC0002 /122
Released By	ffl 6/1/99	n/a
Received		

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RQC053

Quanterra Incorporated
RAD PREP BENCH WORKSHEET

Run Date: 5/19/99
Time: 17:02:49

Prep	Sep1	Sep2	
____	____	____	Samples Covered
____	____	____	Labware Labeled
____	____	____	Verify Test/Container
____	____	____	Samples Ordered Sequentially
____	____	____	Logbooks Entered

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* *
* QC BATCH: 9139411 *
* *
****

Prep Dt/Tm/Person: 5/19/99 0
Sep1 Dt/Tm/Person: 0/00/00 000000
Sep2 Dt/Tm/Person: 0/00/00 000000
Cocktail Date/Time: 0/00/00

S4: Nickel by ICP and Nickel-63 by Liquid Scint
AF: Ni-63 PrpRC5013/5019, SepRC5069
5I: RCH: HANFORD ANALYTICAL

ANL DUE	LOT#,MSRUN#/ WORK ORDER	CLIENT MATRIX	INIT/ FINAL	DISH	GEOM	PPT1WT	pH	COUNT TIME	MID/AVE DATE/TIME	TRACER ID/ SPIKE ID	CRDL	UNITS
4/23/99	J9D080212-001 **CTERK-1-0C**	SOLID									30	pCi/g
4/23/99	J9D080212-001 **CTERK-1-0FS**	SOLID									30	pCi/g
4/23/99	J9D080212-001 **CTERK-1-0GX**	SOLID									30	pCi/g
0/00/00	J9E190000-411 **CW0NA-1-01B**	SOLID									30	pCi/g
0/00/00	J9E190000-411 **CW0NA-1-02C**	SOLID									30	pCi/g
0/00/00	J9E190000-411 **CW0NA-1-03B N**	SOLID									30	pCi/g

PRIORITY

NUMBER OF WORK ORDERS IN BATCH: 6

050